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An Experiment
to Demonstrate the Acquisition and Relearning
of a Paired-Associate Task

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This paper describes and analyzes the results of an expanded version of an experiment described by Dunn and Garrison (1992: 109-117) as an "experiment in verbal learning demonstrat[ing] the nature of the acquisition process". Dunn and Garrison presented a list of thirty pairs of simple, familiar, but unrelated nouns (shown in Table 1); "[the] task is to learn the association of the words in each pair so that when the first word is presented, ...the second word in the pair [can be filled in]". The word-pair list is studied for two minutes, then recall attempted; another two minute study period is followed by another attempt, alternating until two perfect pairing recalls have been accomplished. To demonstrate relearning, the procedure is repeated seven days later. This researcher expanded the experiment to include a separate list of unrelated words, including nouns, verbs and adjectives (shown in Table 2), chosen at random by an assistant, from "Coming into the Country" by John McPhee. This was done to reduce the effect of visual associations in recall, an effect which is described in the analysis of this experiment. ✓

The procedure for the initial (learning acquisition) part of the experiment was conducted on November 11, 1993, in this researcher's apartment in Whitehorse, Yukon; there was no noise or distractions except for a ticking clock. The first two-minute study period of the Dunn and Garrison word list was started at 09:04, immediately followed by the first recall attempt. The cycles were repeated every six minutes. The number of successful pairings was 11, 21, 27, 30, and 30 in the five trials. The

learning curve thus demonstrated is shown in Figure 1. The same procedure was followed with the second list of word-pairs, starting at 12:20. The four trials resulted in 12, 22, 30, and 30 successful pairings. Figure 2 graphs these results.

The procedure for the relearning section of the experiment was conducted in the same location, on November 18, 1993. A major modification was made to the description in Dunn and Garrison (1992:116), by not studying the word pairs prior to the first recall trial. In this way, the effectiveness of the conversion of these semantic memories into long-term memory could be ascertained, as well as the effectiveness of different recall strategies. The first recall attempt of the Dunn and Garrison word pairs was made at 20:52hr, after working a twelve-hour shift driving taxi, and resulted in 28 correct answers. A one-minute study of the word-pair list then resulted in two consecutive scores of 30. The first recall attempt of the added word pairs followed at 21:04hr, with a score of 19 correct answers. A two-minute study of the word-pair list resulted in 29 correct answers on the next trial; another glance at the list was required to then get two consecutive scores of 30. The results of these two series of trials are graphed in Figures 3 and 4 respectively.

This experiment gives a basic look at some of the processes involved in the acquisition and recall of long-term semantic memories. First of all, conducting the experiment in a quiet room reduced the need for selective attention, although there are always distractions, visual if not auditory (Wortman and Loftus 1992:192). The process of effortful encoding transformed the

visual stimuli of the forms of the words on paper into neural memory traces (Wortman and Loftus 1992:193). The encoding strategy of "mentally picturing words" made the memorization of the first list of nouns quite simple, and as shown in Figures 3 and 4, also made retrieval from long-term memory more efficient. ✓ For example, "tree - girl" was visualized as a girl on a swing under a tree; "coat - glass" as a coat hung beside a door with a glass centre panel. The placing of the second list into long-term memory was made more complicated by the use of some words which are not easily visualized; deep processing, or "emphasizing the meaning" (Wortman and Loftus 1992:198) of these word pairs took on several different aspects. Word visualization was used on several pairs, but others were visualized at a certain position on the printed word-pair list ("balance" was on the top of the left column, "smoke" was before "salmon", which was visually paired), and for several others I was unable to discern a retrieval cue. Those words with no conscious retrieval cues were also the words which I could not recall after a one-week delay. The drop in the number of correct answers after the one-week delay is due to either decay, or (more likely) interference from words memorized in different contexts (Wortman and Loftus 1992:213).

As applied to the type of courses taken in college, this experiment emphasizes the importance of at least two learning strategies. First, the importance of deep processing of the information presented, as opposed to shallow processing, or merely scanning the words without attaching meaning to them;

recall of the second word list was made much easier when the words had a meaning in any form. Second, the value of intermittent quizzes was made obvious - if the information has been placed into long-term memory once, studying in order to recall the information for the final exam becomes much more rapid.

- ✓ experiment done well
- ✓ data graphed clearly
- ✓ expansion tests some specificity grouped but - note also 'pairing' vs list memorizing (always tested in ^{same} order)

20/20

Table 1

- | | |
|----------------------|-----------------------|
| 1. pencil - bat | 16. coat - glass |
| 2. earring - mouse | 17. door - bus |
| 3. clock - fork | 18. key - rose |
| 4. ball - cup | 19. ruler - sugar |
| 5. telephone - ruby | 20. spoon - queen |
| 6. book - ear | 21. card - fireplace |
| 7. flower - airplane | 22. thumbtack - stone |
| 8. chair - knife | 23. heart - tulip |
| 9. diamond - shirt | 24. umbrella - church |
| 10. letter - window | 25. eye - boy |
| 11. scissors - cat | 26. briefcase - leaf |
| 12. window - radio | 27. newspaper - king |
| 13. tree - girl | 28. squirrel - car |
| 14. picture - brick | 29. bell - coffee |
| 15. horse - table | 30. hat - violet |

Table 2

- | | |
|-------------------------|-------------------------|
| 1. young - balance | 16. bargain - years |
| 2. shirt - moose | 17. dollar - goal |
| 3. cow - famine | 18. tree - defend |
| 4. antique - rabbit | 19. study - load |
| 5. parasite - hang | 20. sportsman - travel |
| 6. discern - six-pack | 21. beautiful - wine |
| 7. wrecking - worry | 22. distance - manner |
| 8. trustee - fancy | 23. house - meal |
| 9. trifocals - town | 24. arrest - VW |
| 10. forceful - military | 25. fly - kicker |
| 11. number - smoke | 26. landscape - enjoy |
| 12. capital - salmon | 27. jacket - grace |
| 13. majority - grace | 28. zoning - blockhouse |
| 14. place - horizontal | 29. catalyst - window |
| 15. side - belief | 30. flakes - live |

FIGURE 1

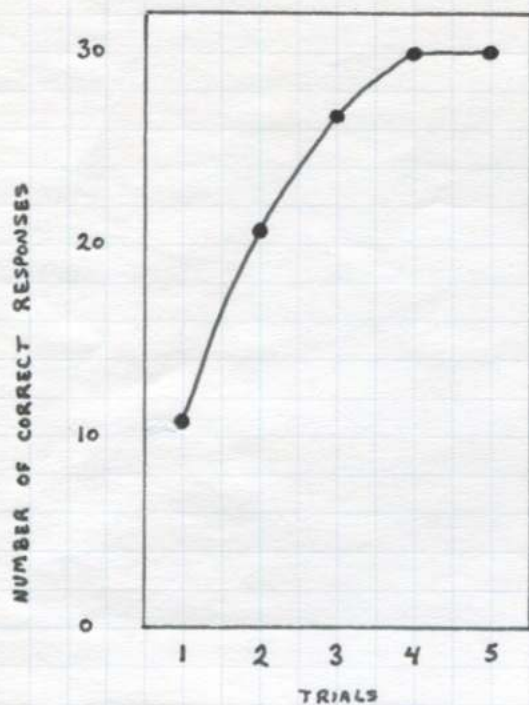


FIGURE 2

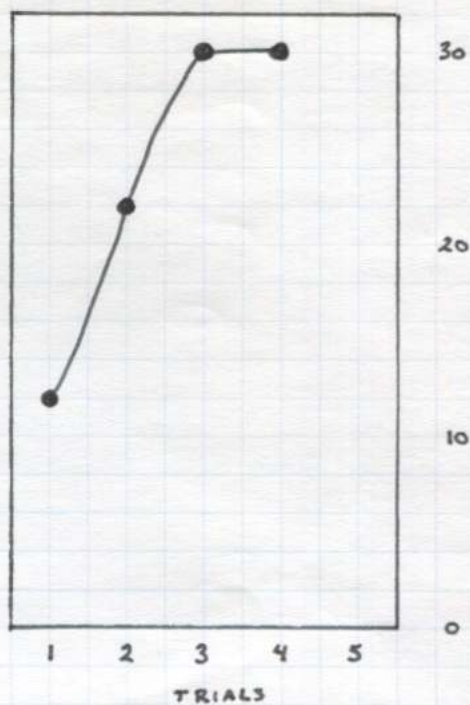
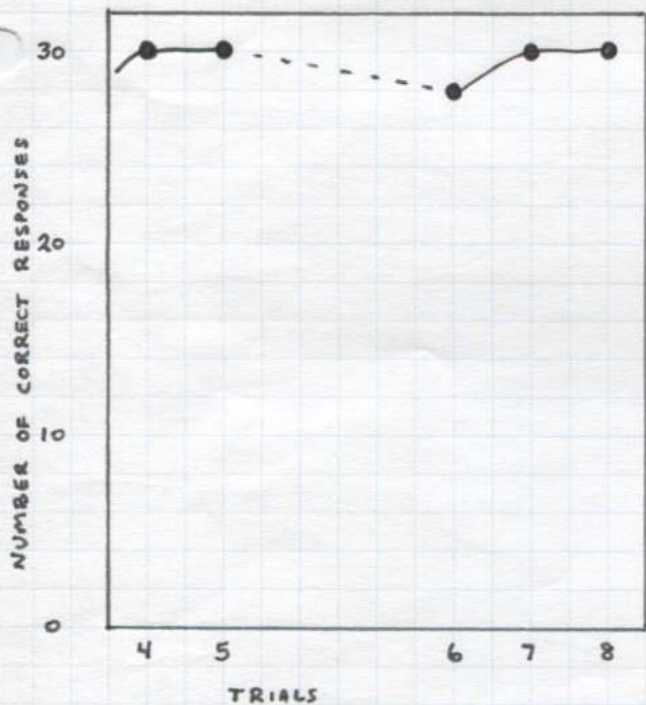
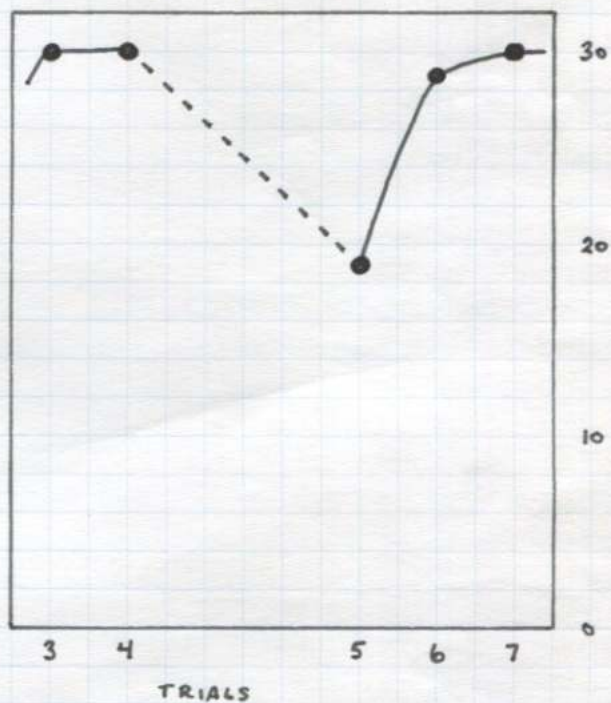


FIGURE 3



— ONE-WEEK DELAY —

FIGURE 4



— ONE-WEEK DELAY —

Bibliography

Dunn, Wendy and Mark Garrison. (1992). Student Study Guide to Accompany Wortman/Loftus. Psychology. (Fourth Edition). New York: McGraw-Hill.

McPhee, John. (1976). Coming into the Country. New York: Noonday.

Wortman, Camille B., Elizabeth F. Loftus and Mary E. Marshall. (1992). Psychology. (Fourth Edition). New York: McGraw-Hill.